

Section 5

Floodplain Management Tools

5.1 Floodprone Areas

One of the major elements of the Master Plan is updated 100-year floodplain and floodway boundary maps. This information will provide a planning tool to protect future homes and businesses from flood hazards and provide guidance for sustainable urban growth in the watershed. In addition, this component of the Master Plan reflects the conclusions of the Mayor's Floodplain Task Force, which recommended that the City continue to develop a comprehensive watershed approach to floodplain mapping using the latest technology and data available to keep the City's FEMA floodplain maps as accurate and reliable as possible.

The current FEMA Stevens Creek floodplain maps were based on a study completed by the Natural Resources Conservation Service (NRCS) in 1978 and were officially adopted for regulatory purposes on February 3, 1982. Through the City's Cooperating Technical Partnership (CTP) program with FEMA, the floodplain maps were updated as part of the Stevens Creek Watershed Master Plan study process. The study updated the floodplain boundary in areas already mapped, and delineated the floodplain boundary along stream reaches not previously studied or mapped by FEMA. The study floodplains are referred to as "floodprone areas." These floodprone areas will be reflected on the FEMA floodplain maps at some time in the future when FEMA finalizes the Flood Insurance Rate Map Physical Map Revision and it is adopted by the City.

The study floodplain maps were submitted to FEMA in December 2004 for preliminary review and comment. The FEMA review process could potentially take several months to more than a year following the final submittal to FEMA and will include a public comment period. The comment period will include a FEMA-hosted public meeting before the maps become officially adopted. In the interim, the City will use study floodplains for the purposes of regulating the floodprone areas until the FEMA approval adoption process is finalized.

The floodprone areas are being used as best available information for City regulatory purposes, in accordance with the *Flood Standards for New Growth Areas* adopted by the City in May 2004. On December 20, 2004, the Lincoln City Council passed a formal resolution authorizing the use of Stevens Creek floodprone areas within the City 3-mile jurisdiction for regulatory purposes.

5.1.1 Flood Insurance Certificates

Flood elevation certificates were prepared by certified land surveyors to verify whether habitable buildings located near the outer edge of the flood fringe were in fact located within the study floodplain. The survey crews obtained first floor elevations to make the determination. The completed flood elevation certificate provides the property owner with some of the necessary documentation to obtain a FEMA Letter of Map Amendment (LOMA). A flood certificate survey was offered to the properties listed in Table 5-1.

**Table 5-1
Properties Offered
a Flood Certificate**

Address
341 Anthony Lane
417 Anthony Lane
330 Anthony Lane
11800 Holdrege
2536 N. 83rd Street
2524 N. 83rd Street
2518 N. 83rd Street
7331 Havelock
7333 Havelock Avenue
7332 Ballard Place
7328 Ballard Place
7321 Morrill Avenue
7410 E. Colfax
7411 E. Colfax
7401 E. Colfax Circle
7325 Yosemite Drive
3550 N. 75th Street
3530 N. 75th Street
9341 A Street
7301 Ballard

5.1.2 Floodplain Delineation Process

HEC-GeoRAS Version 1.0 is a package of ArcInfo macros specifically designed to view and manipulate geospatial data for use in the HEC-RAS model. HEC-GeoRAS was used to create geometric input data for use in the HEC-RAS model and to generate spatially accurate water surface profiles. The HEC-GeoRAS macros are written in the arc macro language (AML) and require the ArcInfo program with the TIN extension.

Stream confluences were not simulated with the HEC-RAS computer model. Per FEMA requirements, stream confluences are to be simulated with HEC-RAS only if coincident peaks occur, which was not the case within this watershed. To accurately map the floodplain at stream confluences, a level pool process was performed. Table 5-2 lists the WSEs at the downstream end of each stream reach, which formed the basis of the floodplain boundary at each confluence location. Reach names are shown on Figure 4-1.

The floodplain boundaries were delineated based on the GIS data and other model parameters. A manual quality control review was conducted to verify the accuracy of the automated process.

5.1.3 Study Floodplain and Floodway Maps

Figure 5-1 represents an overview map depicting the entire watershed divided into 15 floodplain maps. The study floodplain maps are based on existing land use and infrastructure as described in Section 3. Each floodplain map is shown in more detail on Figures 5-2 through Figure 5-16. In addition, four sets of floodplain maps depicting the 100- and 500-year floodplain boundaries and floodway boundary were provided to the City under separate cover at a scale of 1 inch = 400 feet.

Stream profiles for each modeled channel reach were developed depicting the 10-, 50-, 100-, and 500-year water surface elevations. Each floodplain map provides information on the naming convention used to organize the stream profiles. The stream profiles are located in Appendix E, located in Volume II of the report.

5.2 Floodplain Management Strategy

The Master Plan also includes a strategy for adopting design standards needed to address stormwater volume and timing issues of individual detention basins within the larger watershed to avoid adverse downstream flooding impacts. As described in Section 6.7.2, this will involve using the HEC-HMS and HEC-RAS computer model, which were developed as part of the Master Plan study process, during the design of stormwater detention facilities. In addition, the Master Plan assumes the goals and objectives of the Comprehensive Plan regarding floodplain management and the Flood Standards for New Growth Areas will be implemented. These include designating areas for future urban development generally outside of the floodplain and applying No Net Rise, Compensatory Storage, and preservation of Minimum Flood Corridors where development encroaches into the floodplain.

**Table 5-2
Stevens Creek Confluence Level Pool Elevations (NAVD 88)**

<i>Reach Name*</i>	<i>10-year</i>	<i>50-year</i>	<i>100-year</i>	<i>500-year</i>
Main Channel **	1125.32	1129.82	1131.32	1132.02
Overflow **	1119.82	1122.82	1124.22	1125.32
Tributary 07	1140.42	1141.06	1141.34	1141.83
Tributary 10	1150.08	1151.31	1151.77	1152.55
Tributary 105	1139.56	1140.17	1140.43	1140.82
Tributary 110	1161.59	1162.47	1162.76	1163.29
Tributary 1150	1218.98	1219.50	1219.71	1220.17
Tributary 1270	1236.31	1237.54	1237.98	1238.79
Tributary 130	1188.80	1189.41	1189.70	1190.27
Tributary 135	1174.84	1175.92	1176.23	1176.92
Tributary 145	1186.35	1187.69	1188.20	1188.89
Tributary 15	1150.75	1151.81	1152.25	1153.05
Tributary 150	1189.43	1190.26	1190.63	1191.31
Tributary 160	1221.90	1223.52	1224.31	1225.73
Tributary 170	1215.88	1217.30	1217.91	1219.02
Tributary 185	1250.81	1251.51	1251.86	1252.41
Tributary 196	1277.24	1278.08	1278.47	1279.19
Tributary 20	1154.51	1155.34	1155.68	1156.16
Tributary 2150	1246.69	1247.42	1247.75	1248.40
Tributary 2270	1262.01	1262.78	1263.12	1263.78
Tributary 245	1202.37	1203.88	1204.47	1205.44
Tributary 25	1163.65	1164.41	1164.81	1165.61
Tributary 250	1202.33	1202.80	1203.05	1203.51
Tributary 260	1240.83	1241.31	1241.55	1242.28
Tributary 270	1229.44	1231.69	1233.05	1236.66
Tributary 296	1322.98	1323.50	1323.74	1324.25
Tributary 30	1164.91	1165.67	1166.06	1166.84
Tributary 345	1212.93	1215.66	1216.01	1216.52
Tributary 35	1173.31	1174.23	1174.68	1175.56
Tributary 350	1249.01	1249.66	1249.90	1250.44
Tributary 360	1251.76	1252.23	1252.47	1253.02
Tributary 396	1335.88	1336.14	1336.25	1336.50
Tributary 40	1177.59	1178.65	1179.11	1180.06
Tributary 445	1218.64	1219.85	1220.46	1221.90
Tributary 45	1181.65	1182.60	1183.04	1183.97
Tributary 460	1267.38	1268.09	1268.37	1269.10
Tributary 5	1125.74	1129.50	1131.00	1131.70
Tributary 50	1187.73	1188.46	1189.02	1189.83
Tributary 545	1234.72	1235.61	1236.02	1236.76
Tributary 55	1192.75	1193.63	1193.92	1194.51
Tributary 60	1194.15	1195.35	1195.82	1196.57
Tributary 65	1201.48	1203.71	1204.33	1205.09
Tributary 70	1205.49	1207.67	1208.61	1210.15
Tributary 75	1214.24	1216.27	1217.11	1218.80
Tributary 80	1221.10	1223.04	1223.98	1225.47
Tributary 85	1222.98	1225.00	1226.00	1227.70
Tributary 88	1227.16	1229.14	1230.11	1231.85
Tributary 90	1240.22	1241.98	1242.84	1244.36
Tributary 92	1242.65	1244.65	1245.61	1247.41
Tributary 94	1263.00	1264.38	1265.20	1266.29
Tributary 96	1269.90	1272.19	1272.95	1274.04
Tributary 98	1293.82	1294.54	1294.67	1294.93
Tributary OF 05	1137.08	1137.80	1138.03	1138.65

* Reach names are shown on Figure 4-1.

** Obtained from Salt Creek backwater surface elevations published in the current FIS.

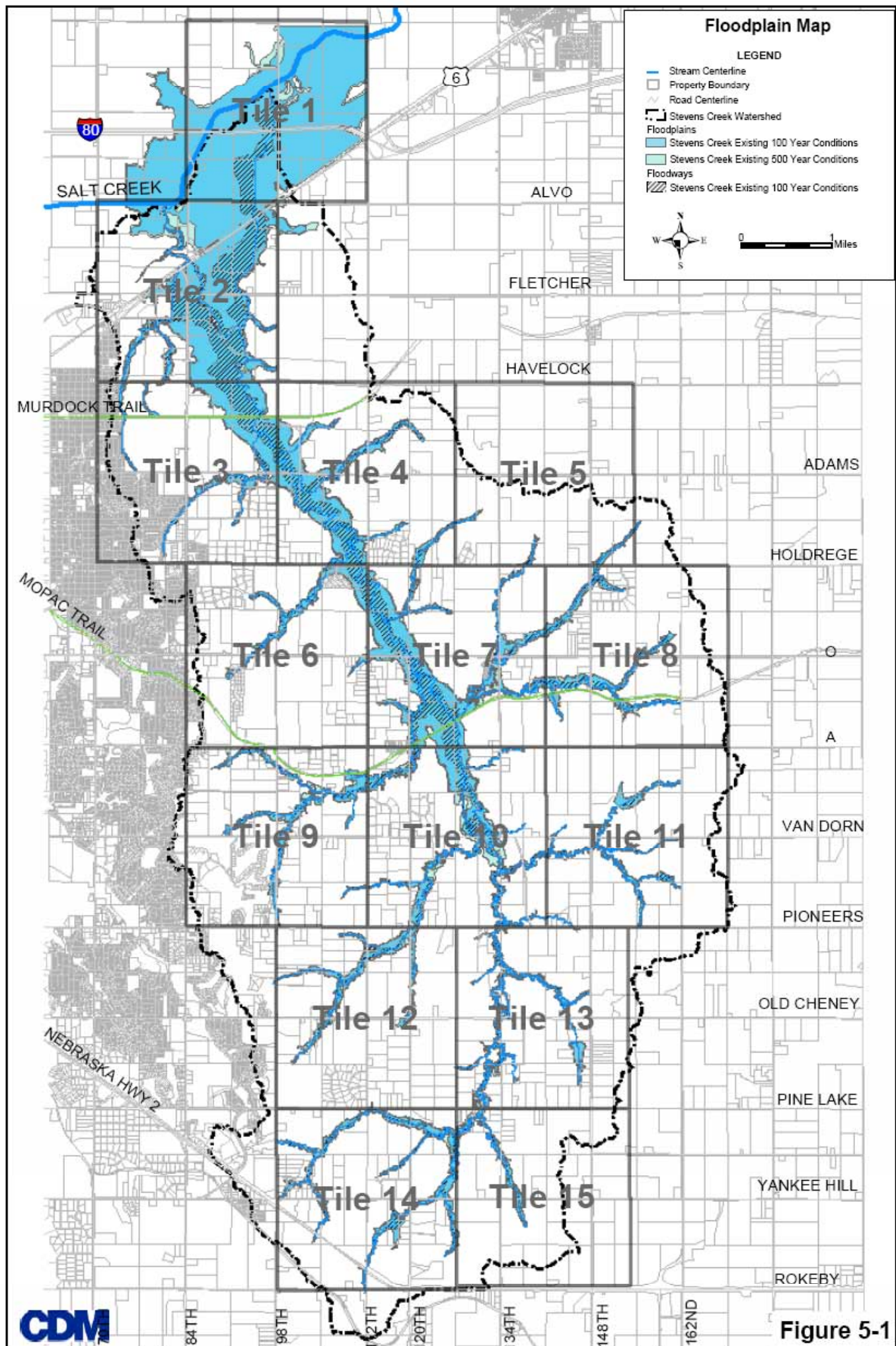


Figure 5-1

**STEVENS CREEK WATERSHED
MASTER PLAN
Lincoln, Nebraska**



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

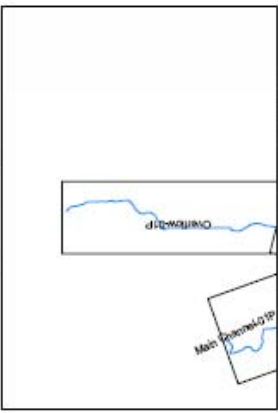
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- ▲ Modeled Drainage Structures
- Stream Centerline
- Property Boundary
- ~ Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodway - Existing Conditions

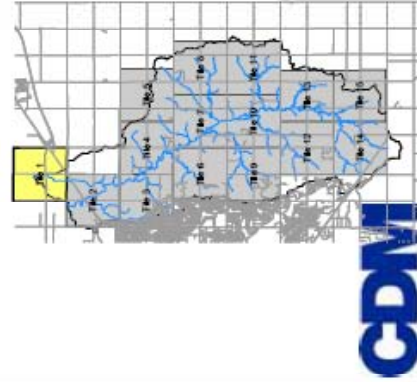
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 Unit: Foot_US
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 USGS LDMR, 2003



Profile Map *



* For stream profiles, see the Stevens Creek Watershed
Planning Study Report, Volume II, Appendix E



CDM
 Title No.:
1

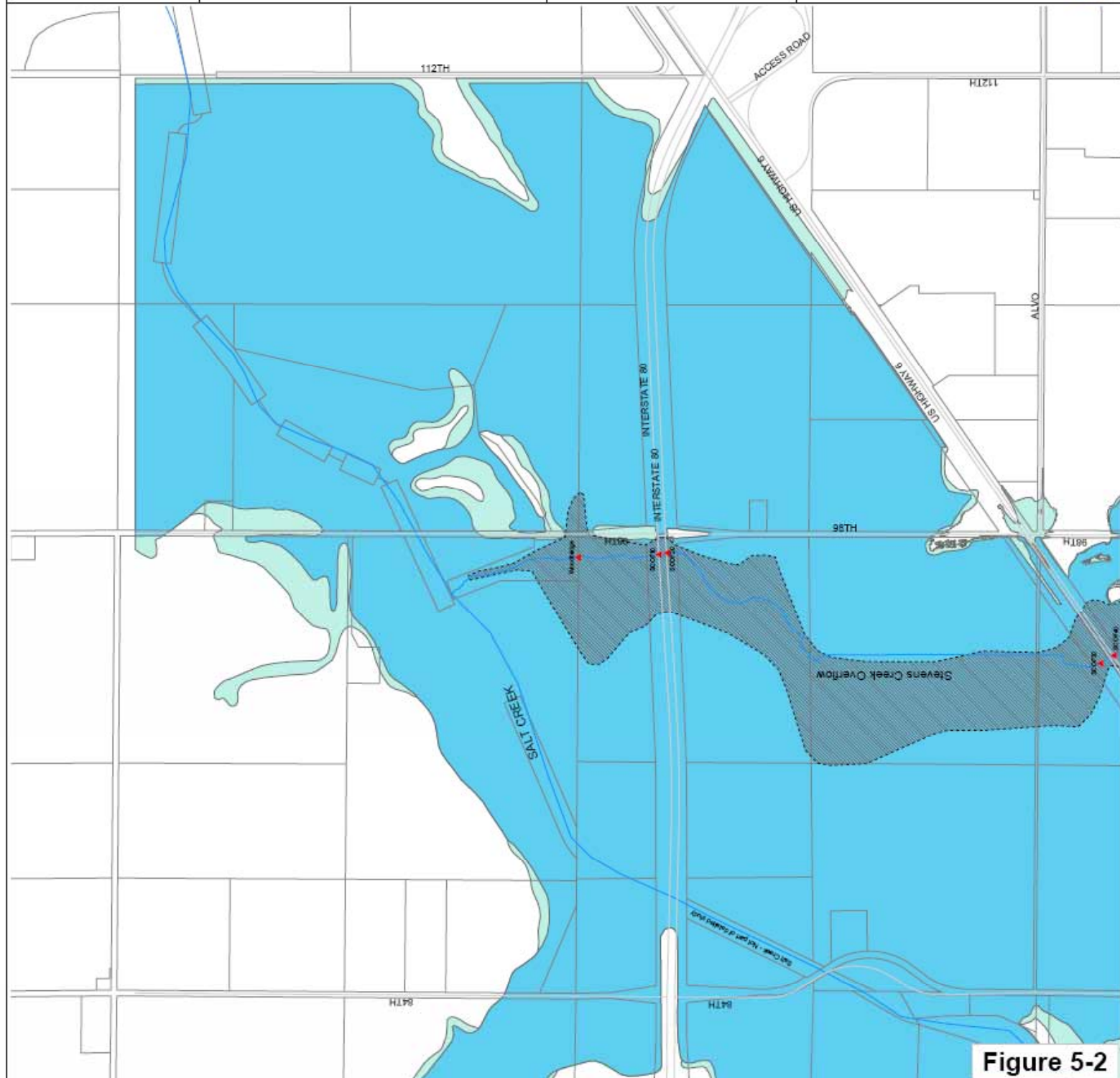


Figure 5-2

STEVENS CREEK WATERSHED MASTER PLAN Lincoln, Nebraska



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

LEGEND

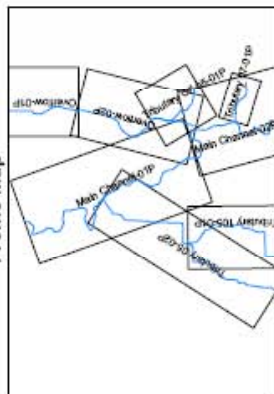
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 - Stream Centerline
 - Property Boundary
 - Road Centerline
 - Limit of Detailed Study
 - 100 Year Floodplain - Existing Conditions
 - 500 Year Floodplain - Existing Conditions
 - 100 Year Roadway - Existing Conditions

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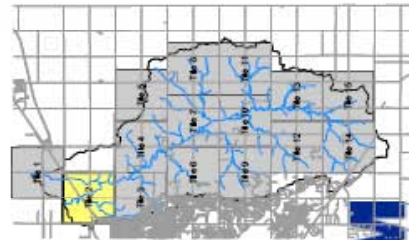
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Profile Map *



* For stream profile, see the Stevens Creek Watershed Planning Study Report, Volume II, Appendix E



Title No.:
2

CDM

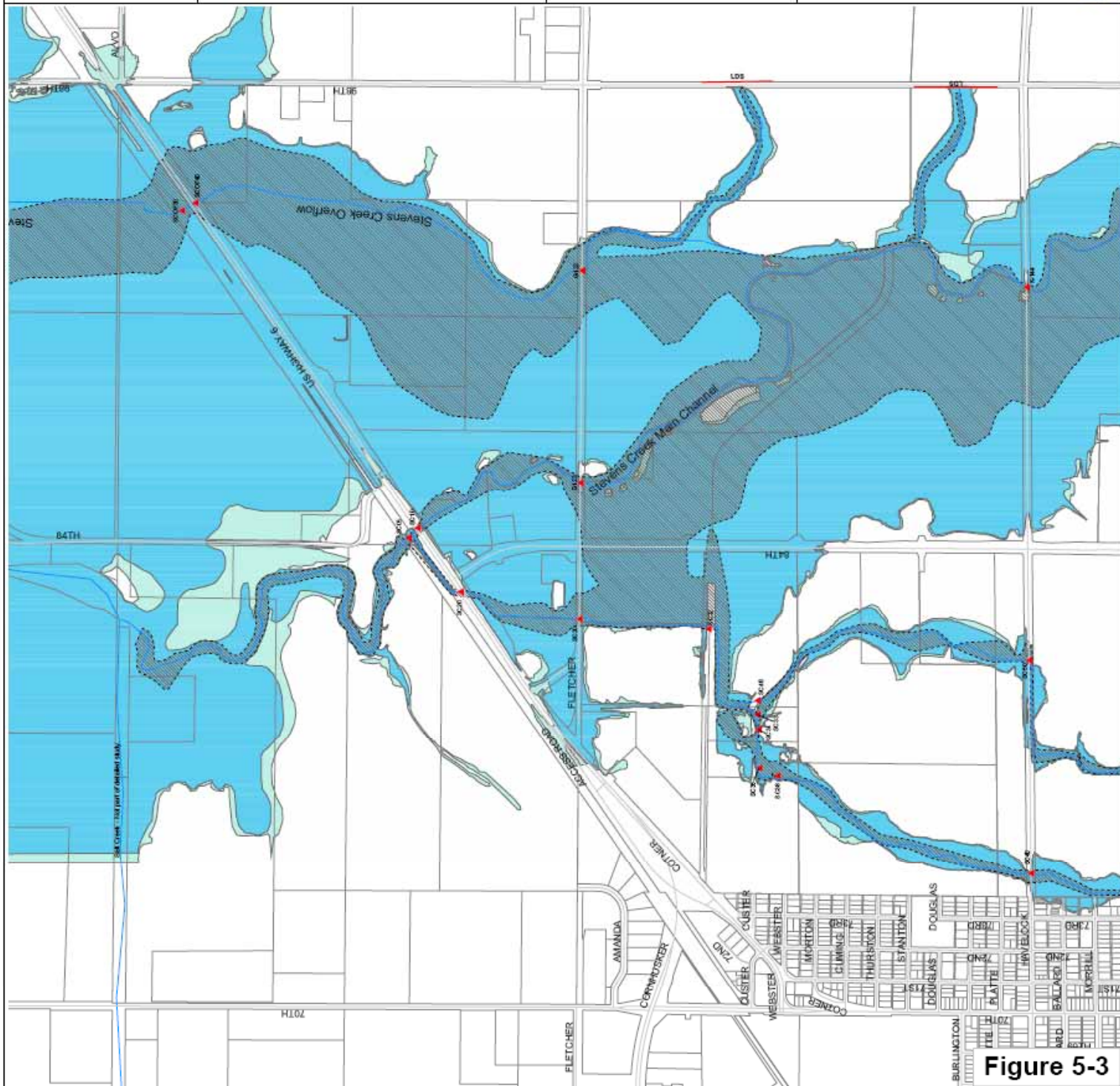


Figure 5-3

STEVENS CREEK WATERSHED MASTER PLAN Lincoln, Nebraska



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

LEGEND

- Modelled Drainage Structures
- Stream Centerline
- Property Boundary
- Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodway - Existing Conditions

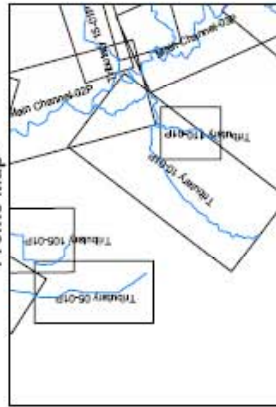
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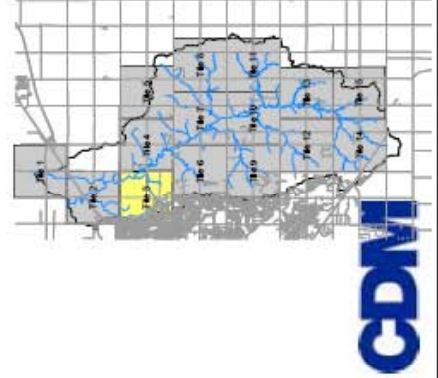
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Profile Map *



* For stream profiles, see the Stevens Creek Watershed Planning Study Report, Volume II, Appendix E



Title No.:
3

CDM

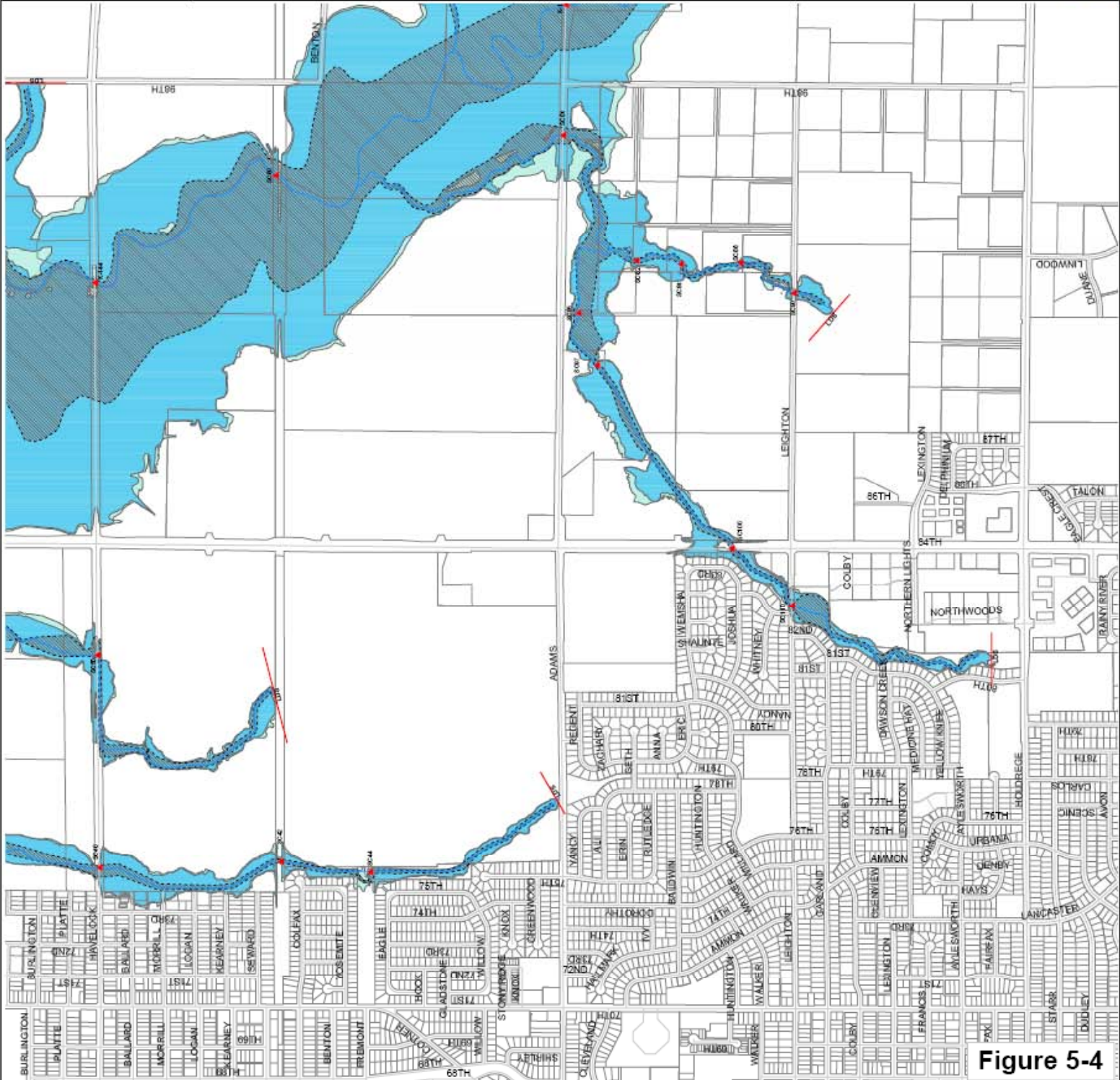


Figure 5-4

In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

LEGEND

- ▲ Modeled Drainage Structures
 — Stream Centerline
 □ Property Boundary
 ∨ Road Centerline
 — Limit of Detailed Study
 ■ 100 Year Floodplain - Existing Conditions
 ■ 500 Year Floodplain - Existing Conditions
 ■ 100 Year Floodway - Existing Conditions

MAP PROJECTION AND DATUMS

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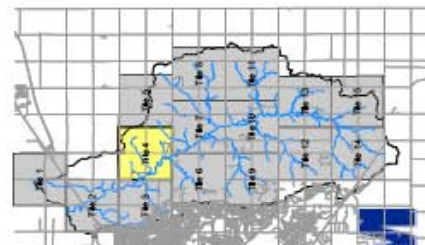
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City of Lincoln, 1997
USGS LIDAR, 2003

Profile Map *



* For stream profiles, see the Stevens Creek Watershed Planning Study Report, Volume II, Appendix E.



Tile No.:

4

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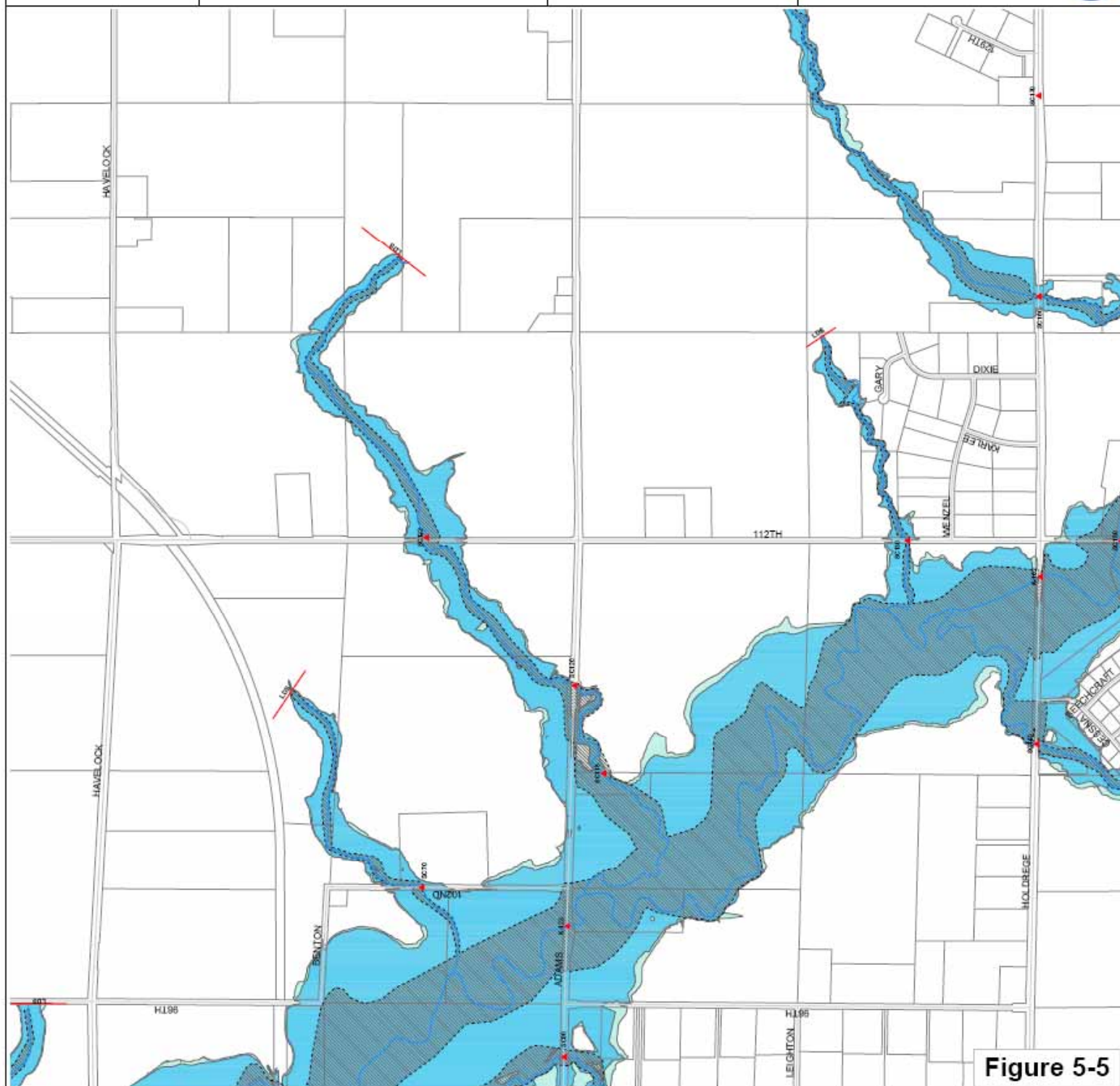


Figure 5-5

**STEVENS CREEK WATERSHED
MASTER PLAN
Lincoln, Nebraska**



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

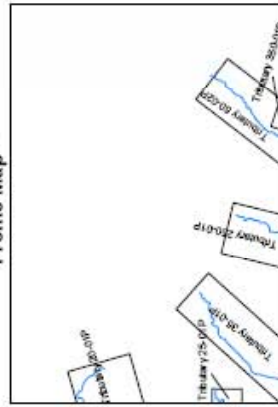
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- Stream Centerline
- Property Boundary
- △ Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodway - Existing Conditions

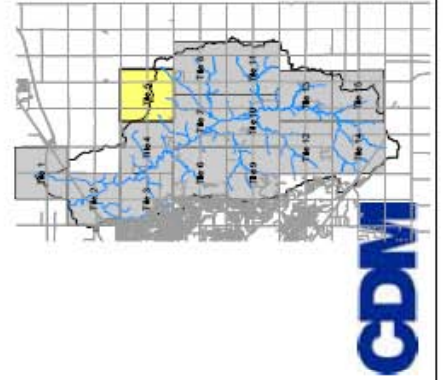
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 USGS LDAR, 2003



Profile Map *



* For stream profiles, see the Stevens Creek Watershed Planning Study Report, Volume II, Appendix E



Title No.:
5

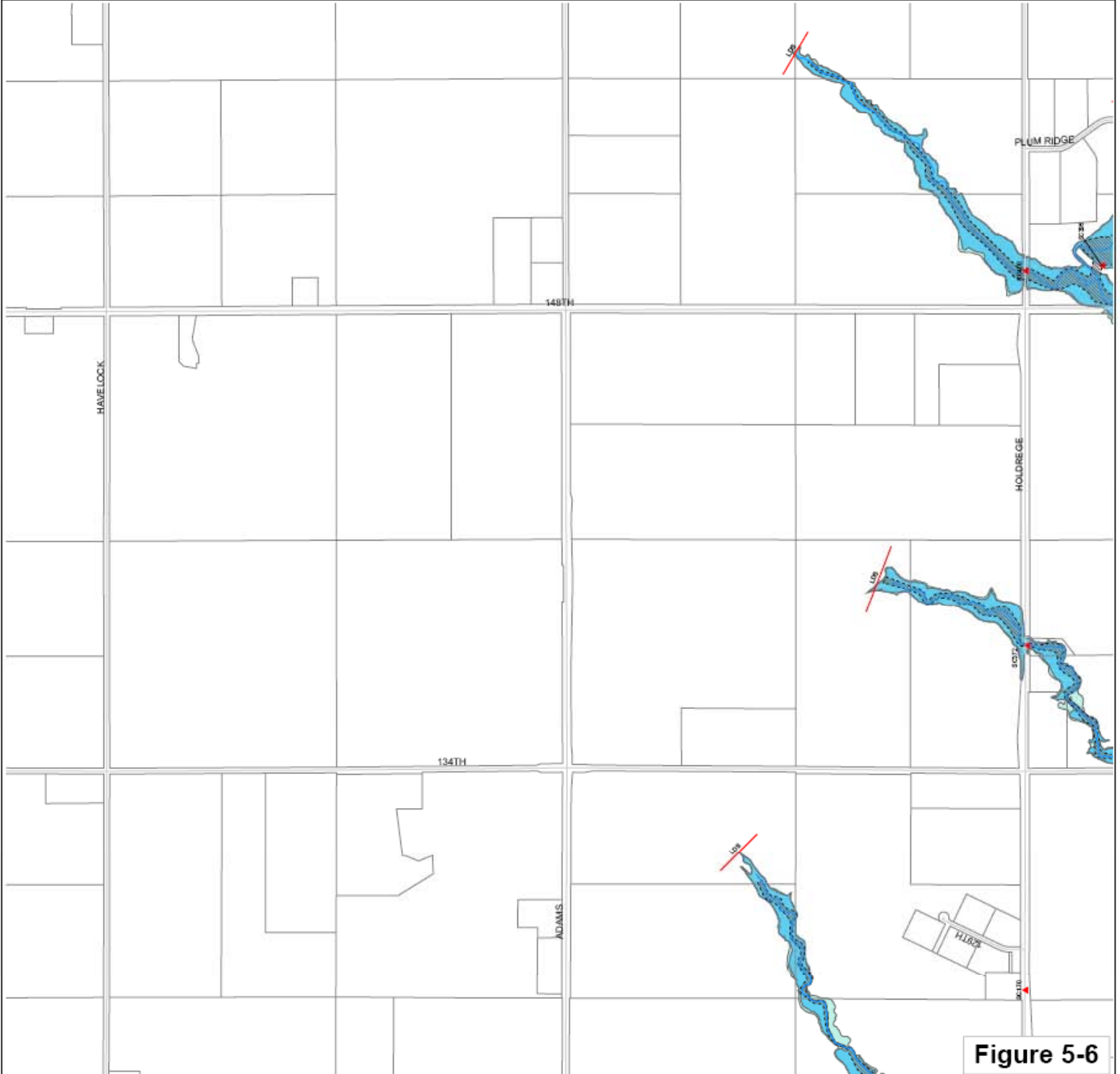


Figure 5-6

STEVENS CREEK WATERSHED MASTER PLAN Lincoln, Nebraska



In Cooperation with the
Lower Platte South NRD



Floodplain Maps

February, 2005

LEGEND

- ▲ Modeled Drainage Structures
- Stream Centerline
- Property Boundary
- △ Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodway - Existing Conditions

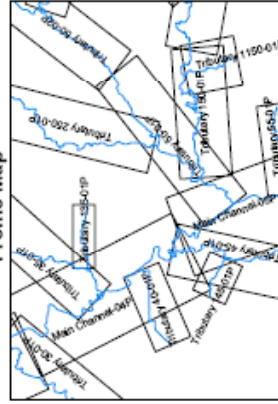
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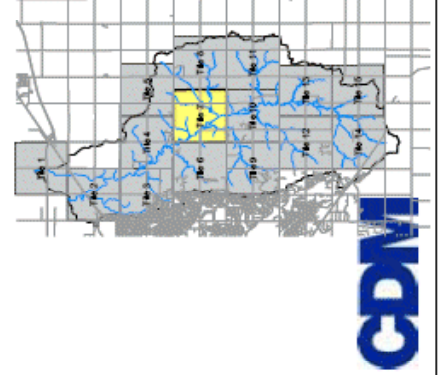
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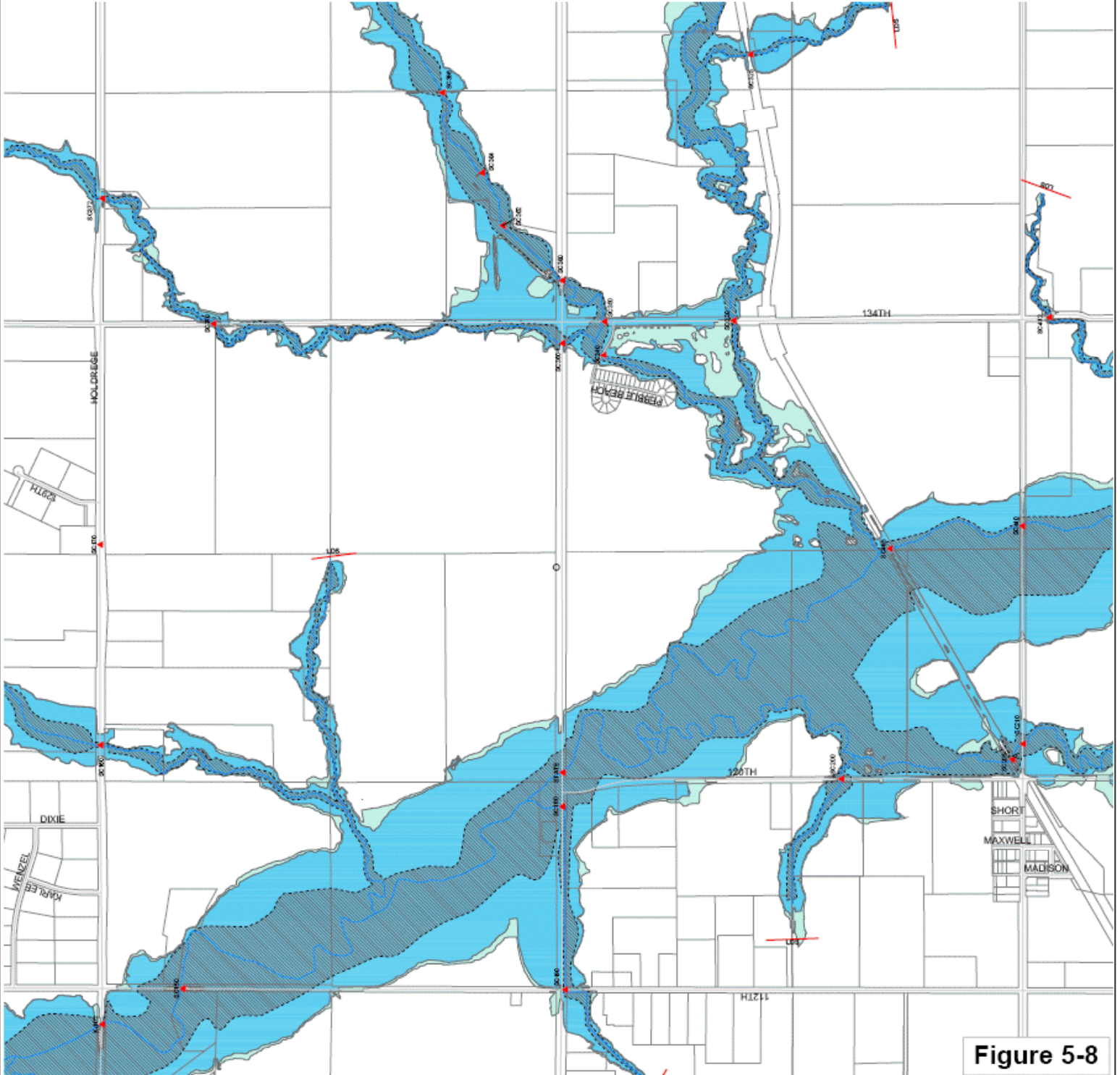
Profile Map *



* For stream profiles, see the Stevens Creek Watershed
Planning Study Report, Volume II, Appendix E



Title No.:
7



STEVENS CREEK WATERSHED MASTER PLAN Lincoln, Nebraska



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

LEGEND

- ▲ Modelled Drainage Structures
- Stream Centerline
- Property Boundary
- ~ Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodway - Existing Conditions

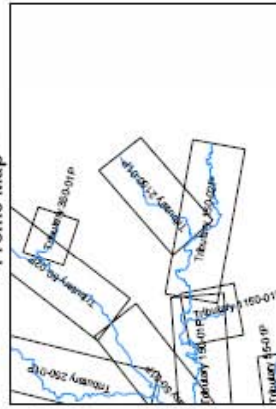
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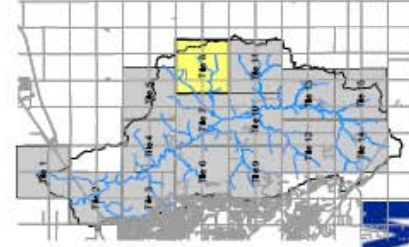


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Profile Map *



* For stream profiles, see the Stevens Creek Watershed Planning Study Report, Volume II, Appendix E



Title No.:
8

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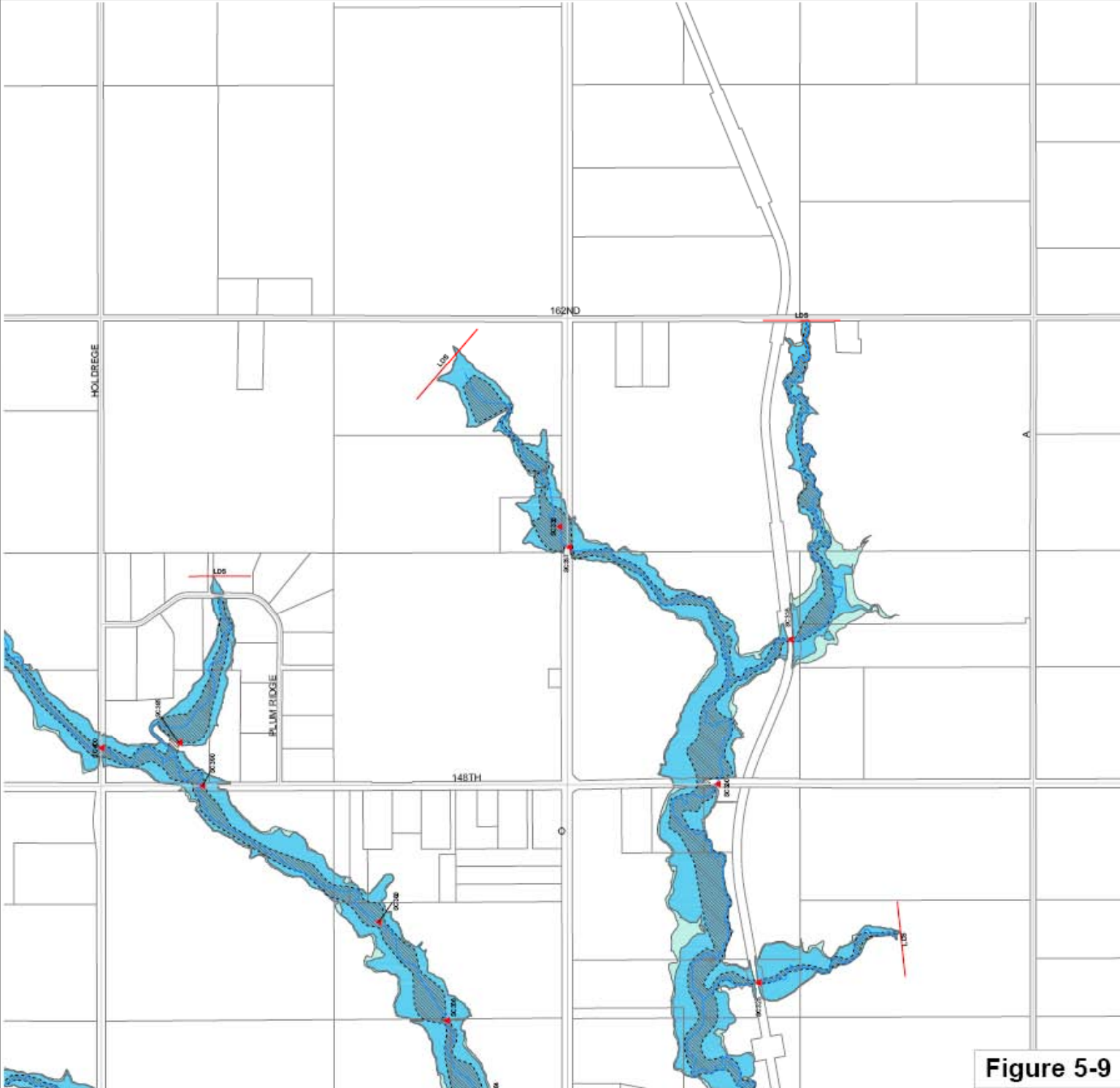


Figure 5-9

**STEVENS CREEK WATERSHED
MASTER PLAN
Lincoln, Nebraska**



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

LEGEND

- Modelled Drainage Structures
- Stream Centerline
- Property Boundary
- Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodway - Existing Conditions

MAP PROJECTION AND DATUMS DATA SOURCES / DATE

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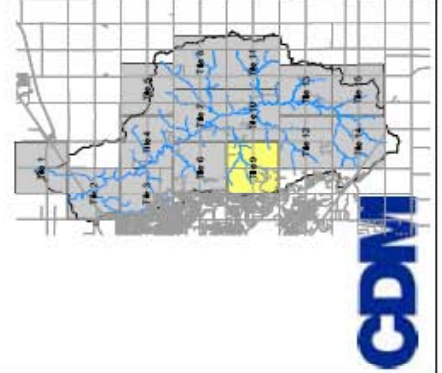
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Profile Map *



* For stream profiles, see the Stevens Creek Watershed Planning Study Report, Volume II, Appendix E



Title No.:
9

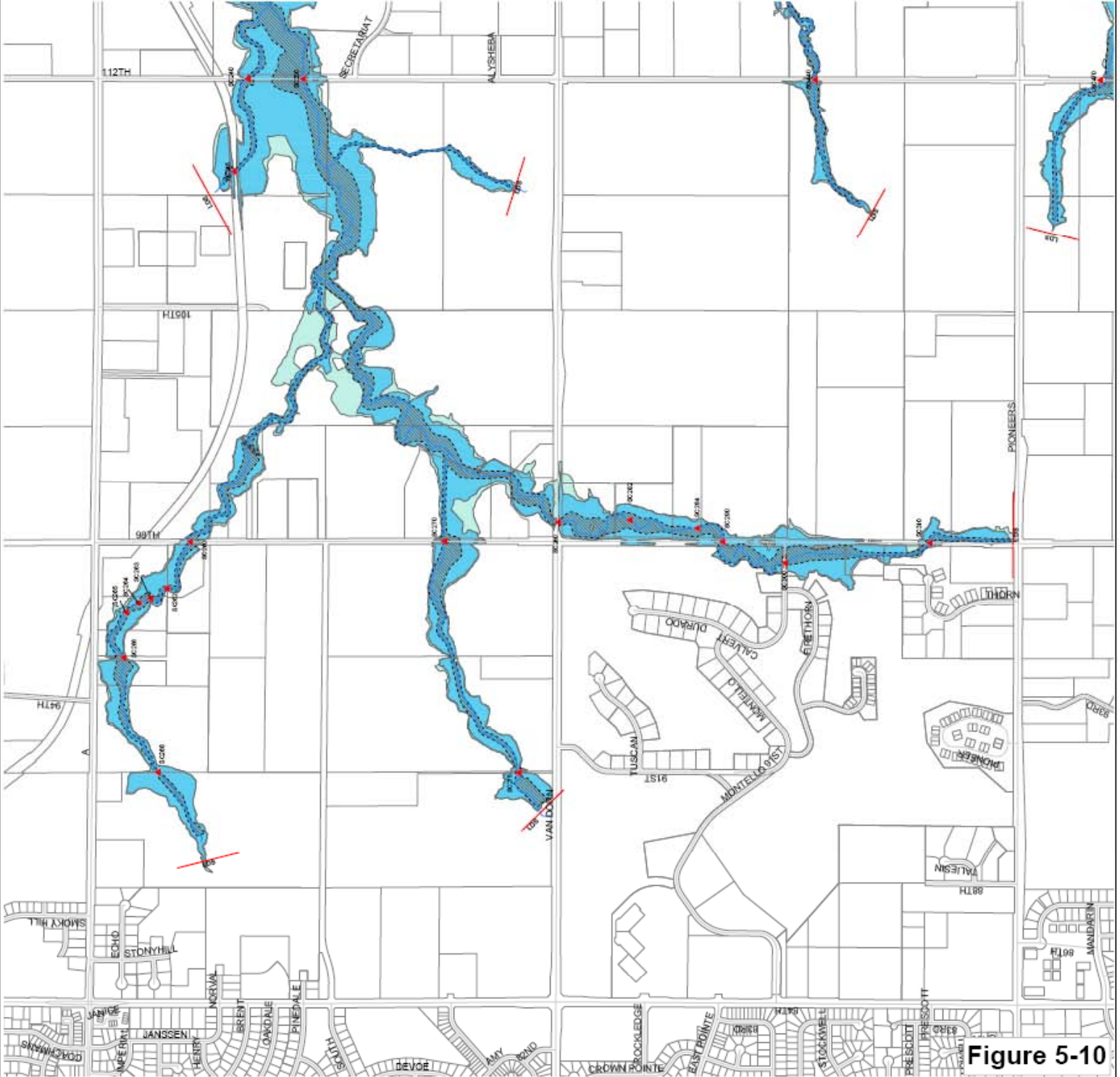


Figure 5-10

STEVENS CREEK WATERSHED MASTER PLAN Lincoln, Nebraska



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

LEGEND

- ▲ Modeled Drainage Structures
- Stream Centerline
- Property Boundary
- △ Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodway - Existing Conditions

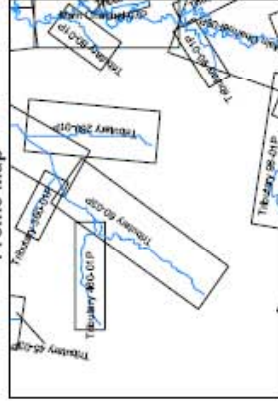
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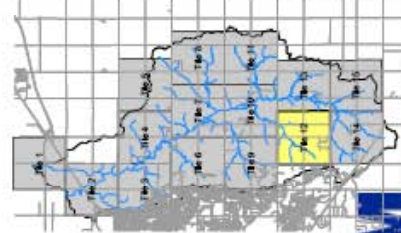
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Profile Map *

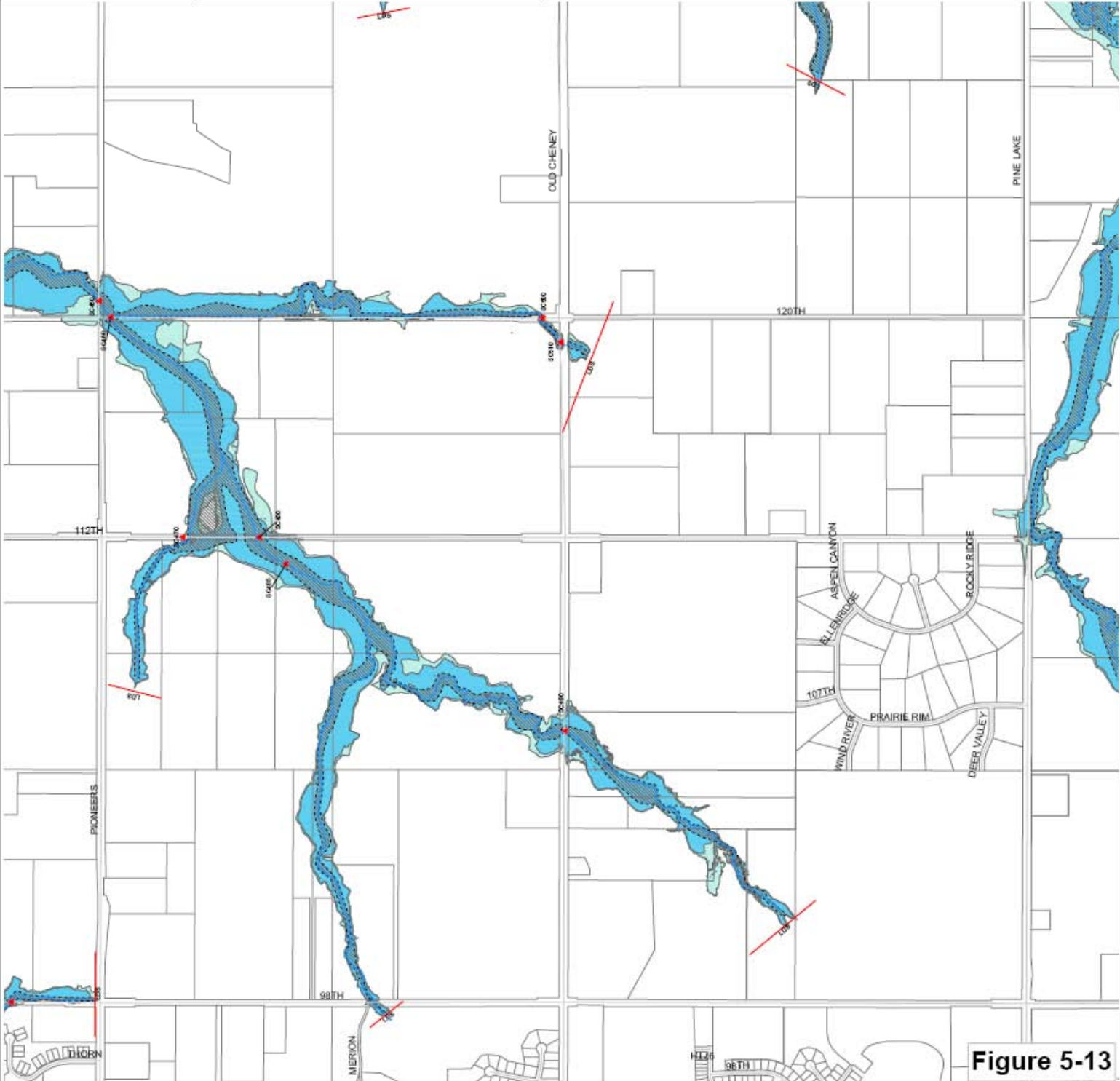


* For stream profiles, see the Stevens Creek Watershed Planning Study Report, Volume II, Appendix E



Title No.:
12

CDM



STEVENS CREEK WATERSHED MASTER PLAN Lincoln, Nebraska



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

LEGEND

- Modelled Drainage Structures
- Stream Centerline
- Property Boundary
- Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodplain - Existing Conditions
- 100 Year Floodplain - Existing Conditions

MAP PROJECTION AND DATUMS

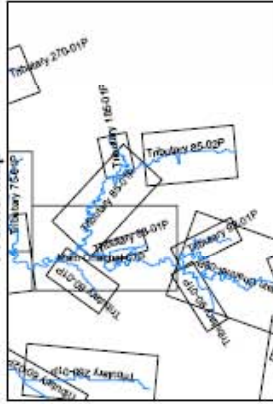
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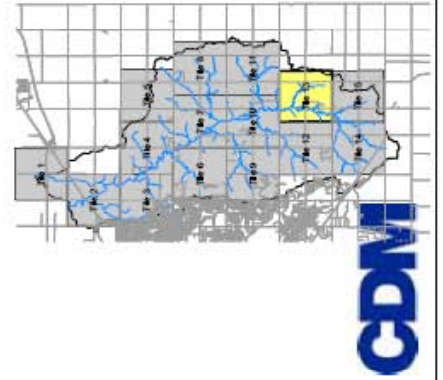
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USGS LDAR, 2003



Profile Map *



* For stream profiles, see the Stevens Creek Watershed Planning Study Report, Volume II, Appendix E



Title No.:
13

CDM

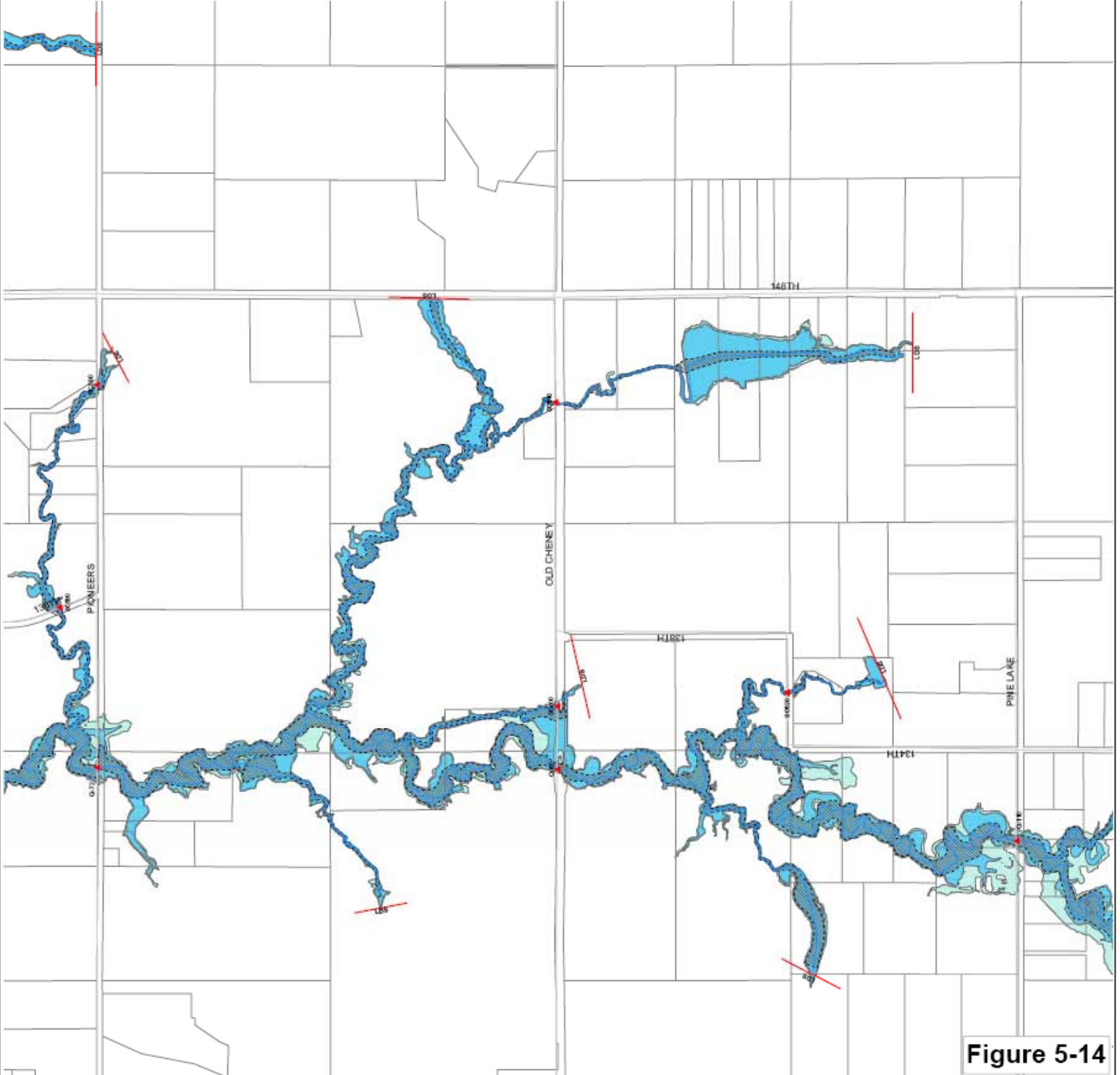


Figure 5-14

**STEVENS CREEK WATERSHED
MASTER PLAN
Lincoln, Nebraska**



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

LEGEND

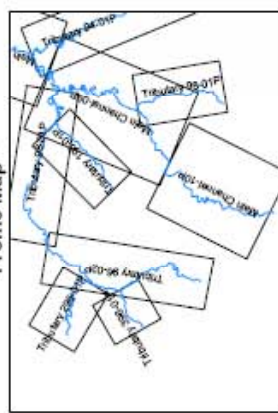
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- Stream Centerline
- Property Boundary
- Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodway - Existing Conditions

MAP PROJECTION AND DATUMS

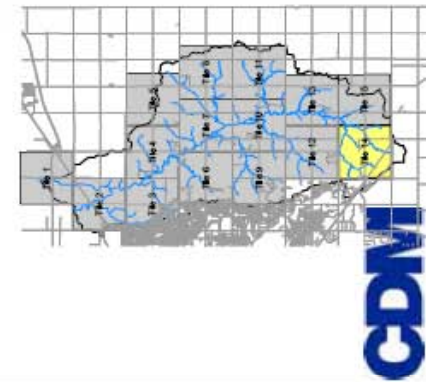
DATA SOURCES / DATE
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 Transverse Mercator
 False Easting: 104041.6666
 False Northing: 0
 Central Meridian: 96.6680
 Scale Factor: 1.00005
 Latitude of Origin: 40.25
 Unit: Foot US



Profile Map *



* For stream profiles, see the Stevens Creek Watershed Planning Study Report, Volume II, Appendix E



Title No.: 14

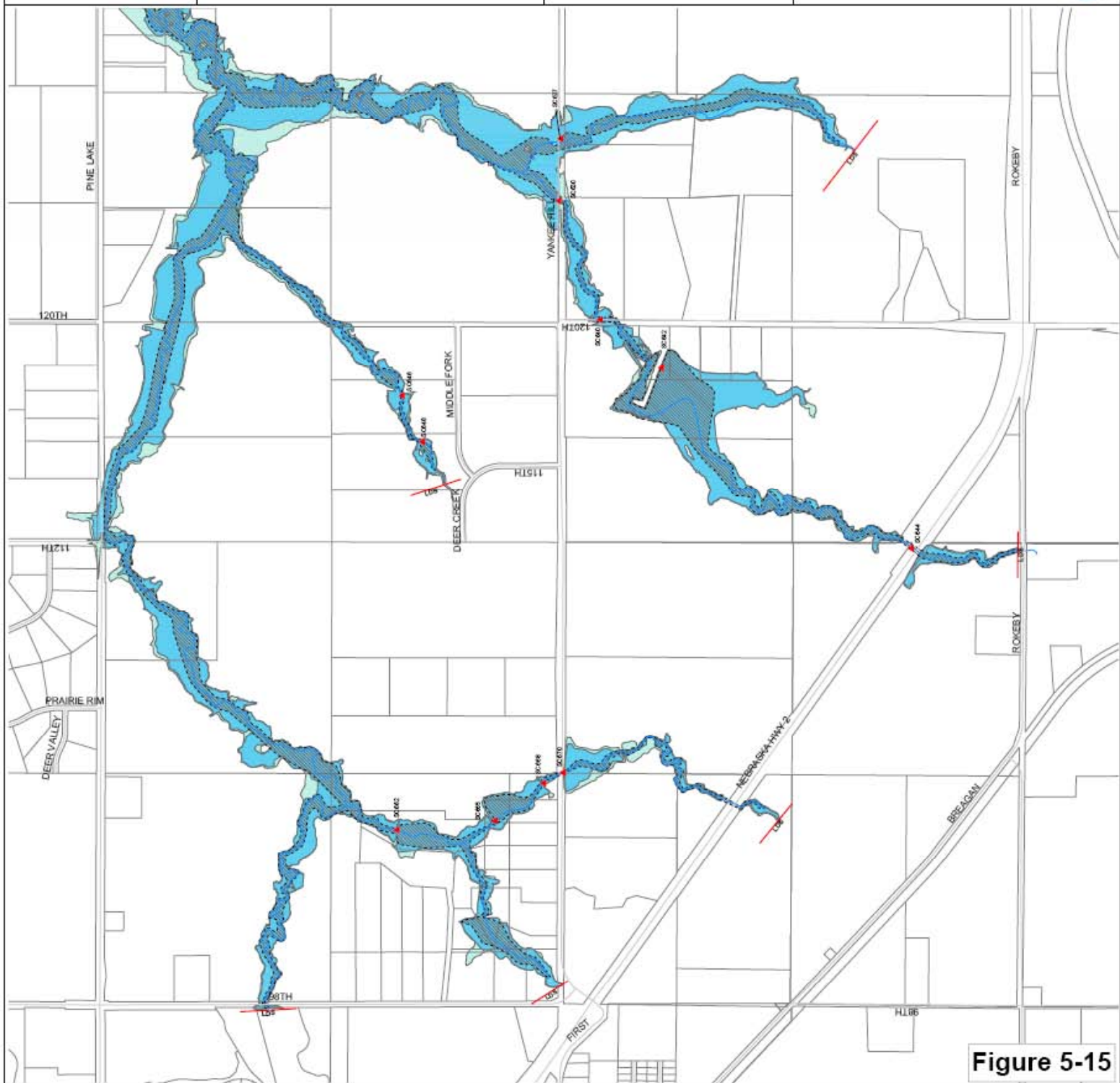


Figure 5-15

STEVENS CREEK WATERSHED MASTER PLAN Lincoln, Nebraska



In Cooperation with the
Lower Platte South NRD

Floodplain Maps

February, 2005

LEGEND

- ▲ Modeled Drainage Structures
- Stream Centerline
- Property Boundary
- △ Road Centerline
- Limit of Detailed Study
- 100 Year Floodplain - Existing Conditions
- 500 Year Floodplain - Existing Conditions
- 100 Year Floodway - Existing Conditions

MAP PROJECTION AND DATUMS DATA SOURCES / DATE

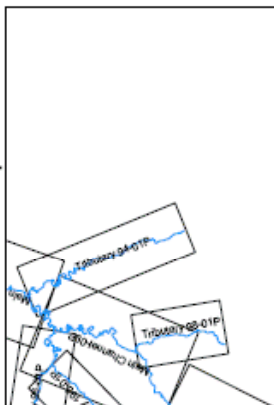
Lincoln Custom Projection,
Transverse Mercator
False Easting: 174041.6666
False Northing: 0
Central Meridian: -96.6880
Scale Factor: 1.00005
Latitude Of Origin: 40.25
Unit: Feet_US

Contours: City of Lincoln 1997
USGS LDAR, 2003

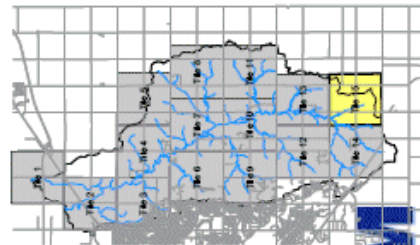
0 1,600 Feet



Profile Map *



* For stream profiles, see the Stevens Creek Watershed
Planning Study Report, Volume II, Appendix E



Title No.:
15

CDM

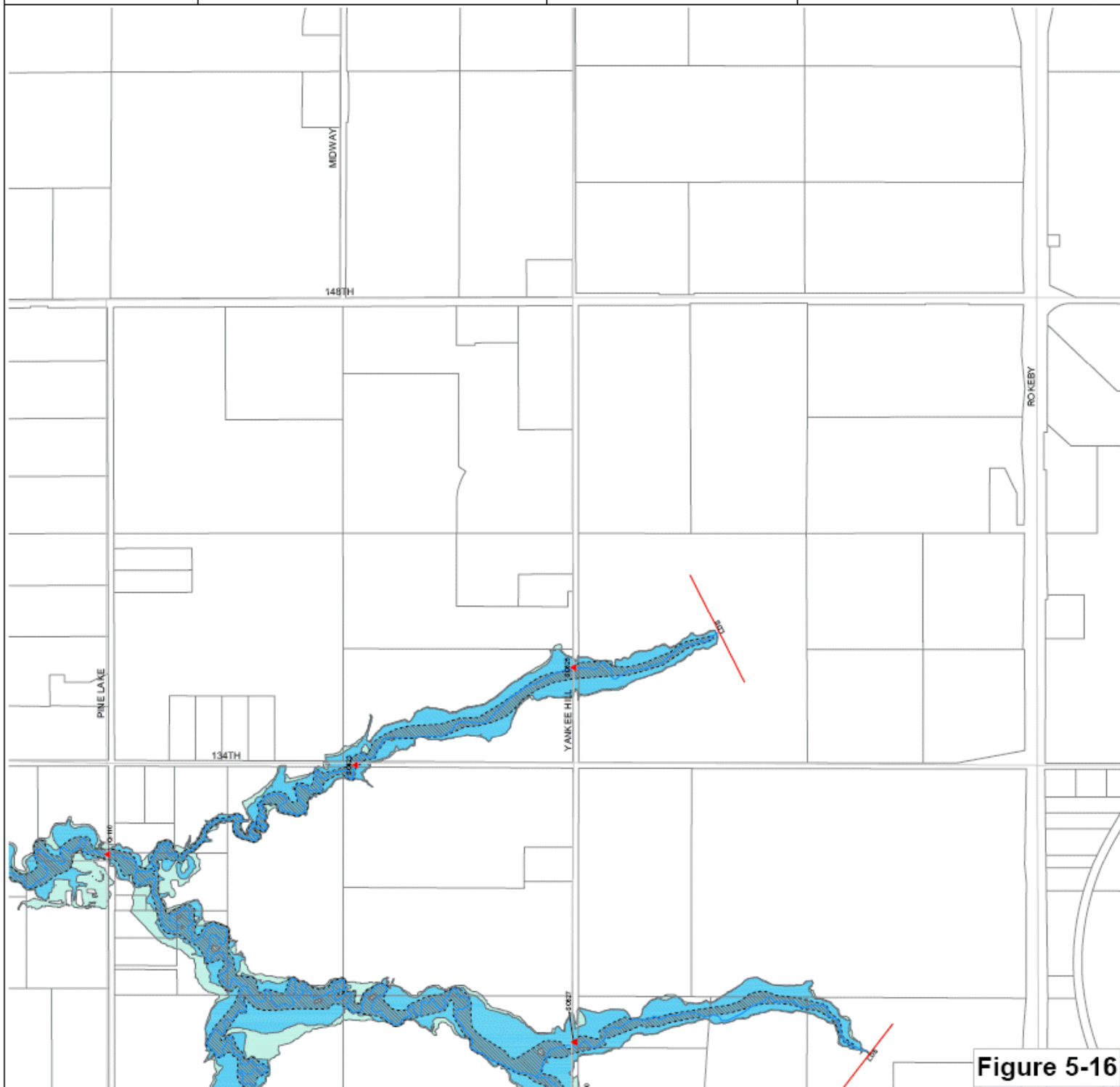


Figure 5-16